



PATENT APPLICATION *IPW*
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Ferruccio I. China, et al.

Serial No.: 10/690,678

Conf. No. 6149

Filed: October 22, 2003

For: ROCK BREAKER TOOL

Primary

Examiner: SINGH, SUNIL

18, 2005

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CERTIFICATE OF MAILING

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Aug. 18, 2005
Date

Thomas R. Vigil
Thomas R. Vigil
Attorney for Applicants
Reg. No. 24,542

TRANSMITTAL OF PRIORITY DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Enclosed is a Certified Copy of Canadian Patent Application No. 2,409,464 to support applicants' claim to priority under 35USC § 119.

If any fee may be required for this submission, please charge same to our Deposit Account No. 230920.

Respectfully submitted,

WELSH & KATZ, LTD.

By Thomas R. Vigil
Thomas R. Vigil
Reg. No. 24,542

WELSH & KATZ, LTD.
120 South Riverside Plaza – 22nd Floor
Chicago, Illinois 60606
(312) 655-1500

Dated: August 18, 2005



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attached hereto and identified below are
true copies of the documents on file in
the Patent Office.

Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,409,464, on October 22, 2002, by FERRUCCIO H. CHINA and CARLO B. CHINA,
for "Device for Breaking Rocks and The Like without Explosives".

Gracy Paulhus
Agent certificateur/Certifying Officer

August 16, 2005

Date

Canada

(CIPO 68)
31-03-04

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ABSTRACT

The Rock Breaker Tool fits snugly into the cores hole and Hardened Inserts expand outward exerting tremendous force on the wall of the hole to break the rock or concrete. When the rock or concrete breaks, the breaking action is a gentle "burst" without flying debris and loud exploding noises. This Rock Breaker Tool can be set-up in a series of units spaced approximately 24 to 36 inches apart to bring an entire rock face down in quarries and/or can be used as a single unit to break oversized rock or concrete into smaller pieces. This Tool can also be used to break up concrete walls or slabs in city limits where explosives cannot be used.

DEVICE FOR BREAKING ROCKS AND THE LIKE WITHOUT EXPLOSIVES

BACKGROUND OF THE INVENTION

The Rock Breaker Tool was developed as an economical mechanical alternative to using explosives to break out rock from sides of rock quarries and breaking up rock into smaller manageable pieces to feed into rock crushers. This Rock Breaker also breaks up concrete in areas which explosives cannot be used. Currently rock quarries use a series of cored holes in rock faces and fill them with explosives. When these explosives are discharged the flying debris becomes very dangerous and most of the time leaves the rock in large pieces which must be exploded again into smaller manageable pieces to be crushed. The explosives are an expensive one-time use and are very hazardous to handle and ship. Explosives are also banned in areas such as city limits and in some areas of mines.

SUMMARY OF THE INVENTION

The Rock Breaker Tool was developed to incorporate the same series of cored holes in rock or concrete but uses a mechanical force to expand in the holes and gently break rock or concrete. The Rock Breaker Tool fits snugly into the cores hole and Hardened Inserts expand outward exerting tremendous force on the wall of the hole to break the rock or concrete. When the rock or concrete breaks, the breaking action is a gentle "burst" without flying debris and loud exploding noises. This Rock Breaker Tool can be set-up in a series of units spaced approximately 24 to 36 inches apart to bring an entire rock face down in quarries and/or can be used as a single unit to break oversized rock or concrete into smaller pieces. This Tool can also be used to break up concrete walls or slabs in city limits where explosives cannot be used.

BRIEF DESCRIPTION OF THE DRAWINGS

The preferred exemplary embodiments of the present invention will now be described in detail with the annexed drawings in which, figures 1-7 show details of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

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The Rock Breaker Tool uses a Hydraulic Cylinder 10 to force a Tapered Plunger 11 downward to spread a Segmented Tapered Spool 12 horizontally outward. This Spool 12 is made up of 4-segments 13, 14, 15 and 16 with hardened Inserts 17, 18, 19 and 20 bolted onto each segment. These Inserts extend outward horizontally to exert force on the wall of the hole and are removable to facilitate replacement as they wear out or as different shapes of inserts are required. As the tapers 21 and 22 of Plunger 11 is pushed vertically downward onto the taper of the Segmented Spool, the Spool pieces move outward horizontally accordingly as the diameter of the taper on the Plunger grows larger. A second Small Segmented Equalizing Spool 23 is located at the bottom of the Main Segmented Tapered Spool 12 to assist in the spreading action and ensuring the Segments 13, 14, 15 and 16 and Inserts 17, 18, 19 and 20 move directly horizontally. As the Hydraulic Cylinder 10 retracts the Plunger 11 of the Rock Breaker, the Segments of the Main Spool 12 retract with the aid of two springs for each of the four segments.

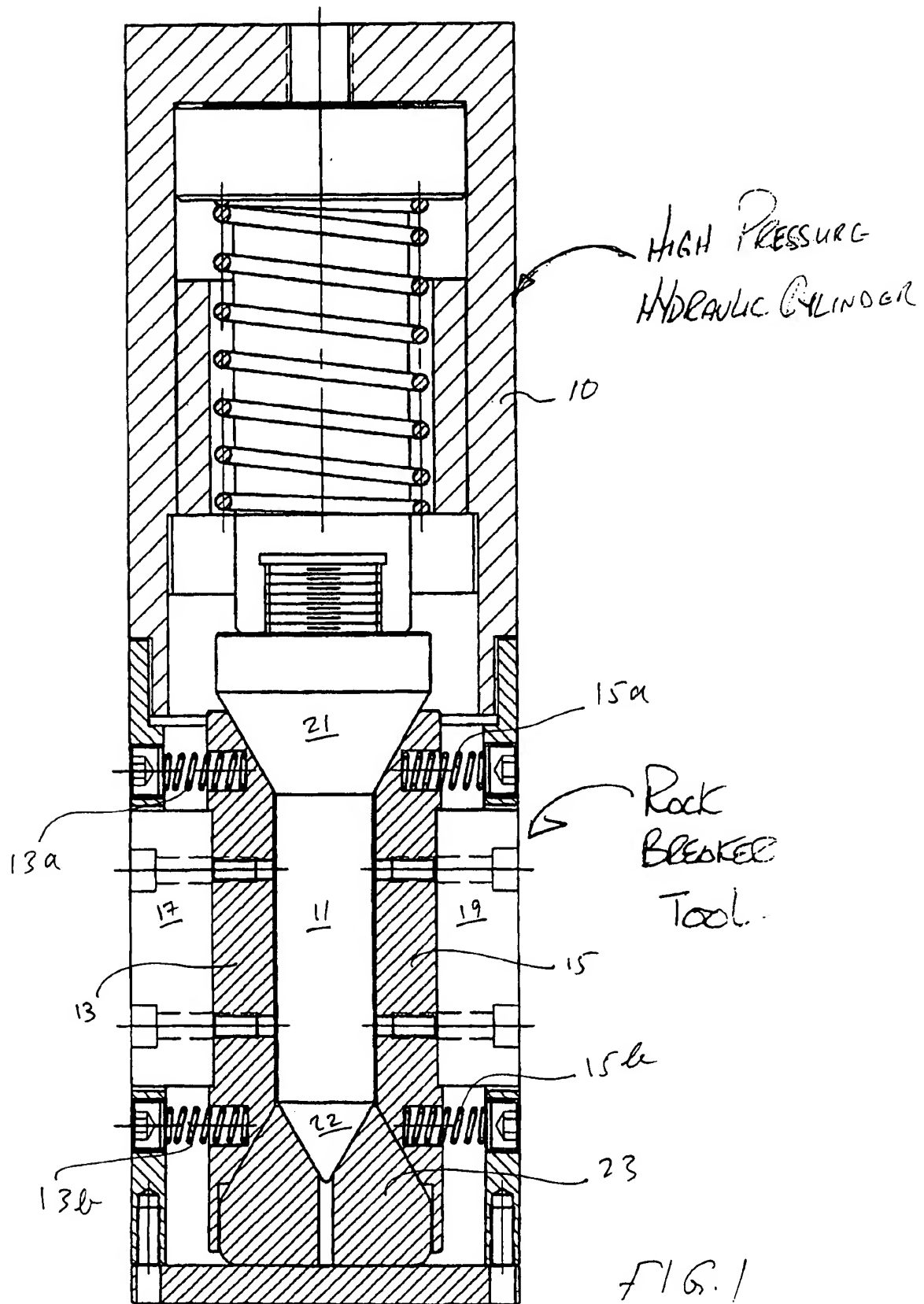
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The Hydraulic Cylinder 10 which extends the plunger 11 is rated for a maximum 10,000psi working pressure and is powered by an electric or gasoline powered Hydraulic Pump depending on the application in which the Rock Breaker is being used.

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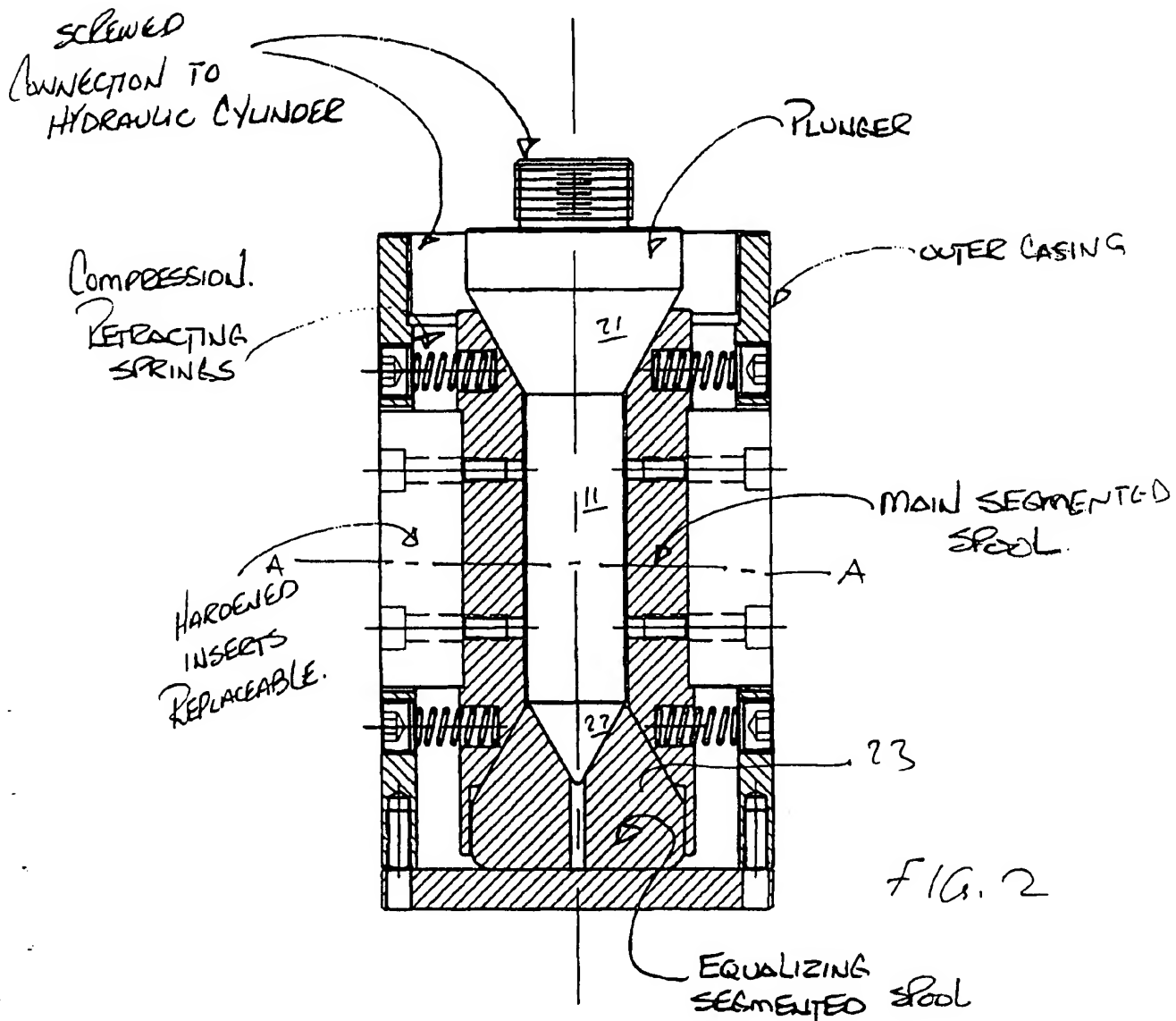
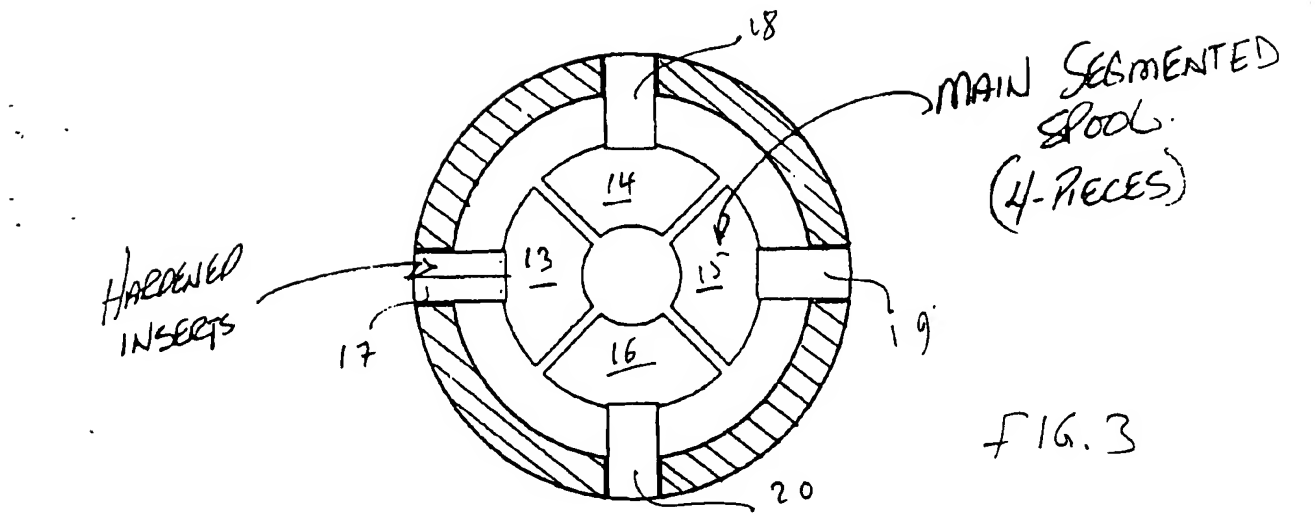
WHAT IS CLAIMED IS:

1. A device for breaking rocks without explosives, comprising: a partially hydraulically pressurizable chamber having first and second ends for insertion into a tightly fitting hole; a plunger disposed within the chamber having a partial taper of its body abutting an outwardly displaceable segment of an outer wall of a non-pressurizable section of the chamber; whereby as hydraulic pressure is applied to the chamber said plunger is forced between the first and second ends and displaces the segment of the outer wall.

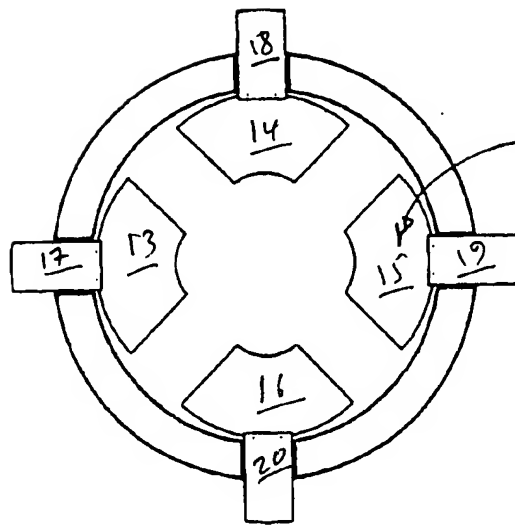


ROCK BREAKER TOOL

FIG. 1

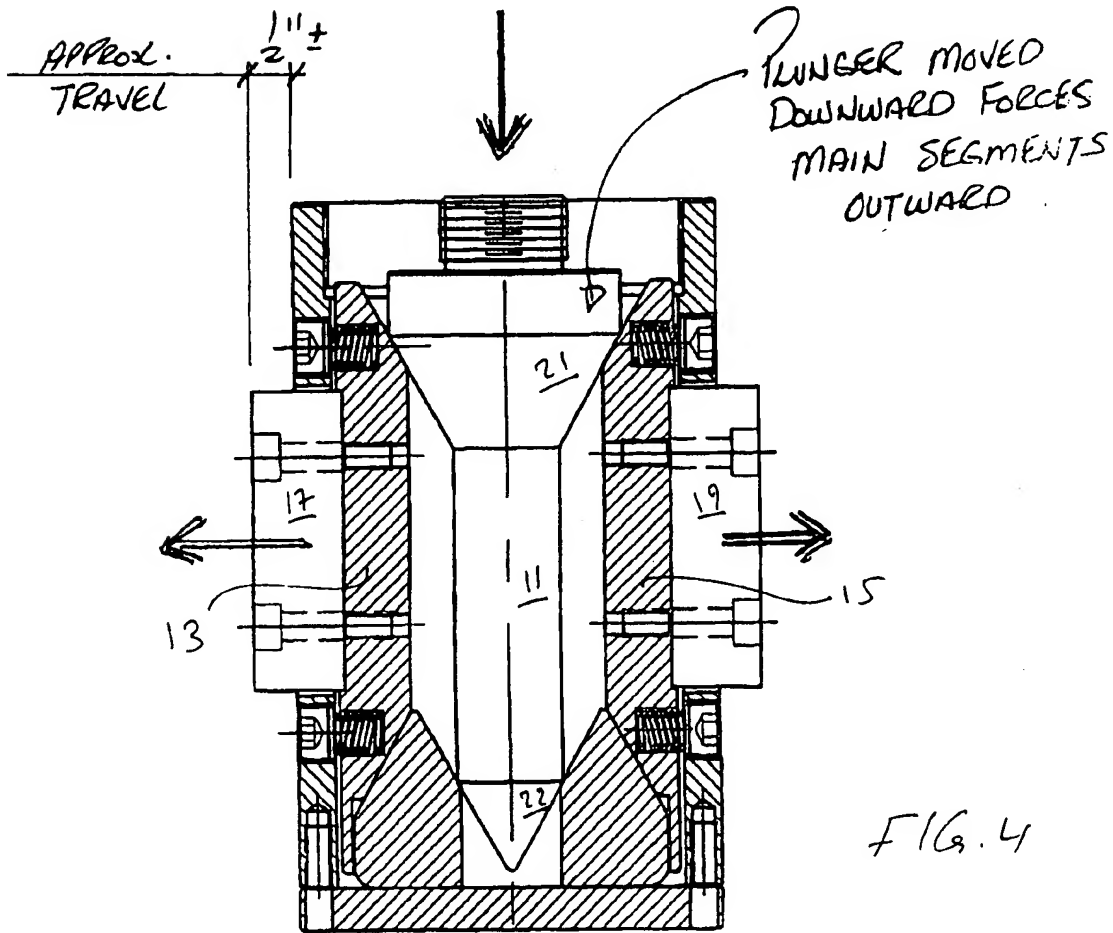


Rock Breaker - Retracted Position.



SEGMENTED
SPOOL FORCED
OUTWARD.

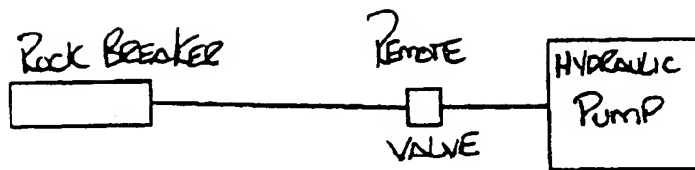
FIG. 5



PLUNGER MOVED
DOWNWARD FORCES
MAIN SEGMENTS
OUTWARD

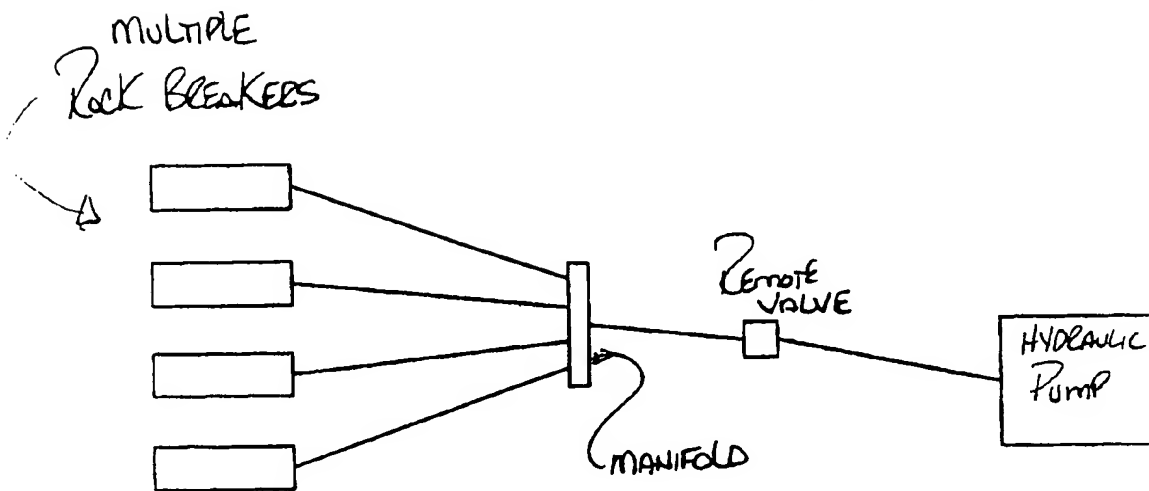
FIG. 4

ROCK BREAKER - EXTENDED POSITION



SINGLE ROCK BREAKER

FIG. 6



MULTIPLE ROCK BREAKER

FIG. 7